



ZENOTEC MINI

Operating Instructions Version 1.0

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1 General

1.1 Preface

Dear Customer

Thank you very much for the confidence you have placed in us by choosing the Zenotec mini dental milling system. The design and execution of the Zenotec mini system complies with the current state of the art. In order to achieve the full performance of the milling system and to ensure continuous operability, comprehensive training of the operating personnel by our experts is required. At the same time, this ensures the constant availability of the system. The present user manual serves as training and reference documentation. It should be available to the operating personnel at all times. Please keep it in an easily accessible place close to the system.

Editorial note

We are grateful for all suggestions for improvement and constructive comments. By your cooperation you make a vital contribution to optimising the Zenotec mini and the related documentation. If you have any further questions, please directly contact the advisors at WIELAND Dental + Technik GmbH & Co. KG:



Wieland Dental + Technik GmbH & Co. KG

Lindenstraße 2
75175 Pforzheim Germany

Zenotec Support

Phone national: 08 00 / 93 66 823
Phone international: +49 72 31 / 37 05 400
Fax: 0 72 31 / 35 79 59
email: info@wielanddental.de
www.wielanddental.de

1.2 Product identification

1.2.1 System designation

Dental milling system: Zenotec® mini

1.2.2 Distributor

Wieland Dental + Technik GmbH & Co. KG

Lindenstraße 2

75175 Pforzheim Germany

1.2.3 Certificate of origin

The dental milling system Zenotec mini was designed and manufactured in Germany.

1.2.4 Document

User manual for Zenotec mini milling system. Published February 2011 The present manual was compiled in accordance with the EC Machinery Directive 42/2006, Annex 1, Number 1.7.4 "Instructions".

Documentation and layout:

Wieland Dental + Technik GmbH & Co. KG

1.2.5 Copyright

All rights reserved. No part of this manual must be copied, photocopied, reproduced translated or converted to an electronic or machinereadable form without prior written permission of Wieland Dental + Technik GmbH & Co. KG.

1.3 Name plate and CE mark



1.4 Terms of guarantee

Guarantee and liability

Guarantee and liability are subject to the contractual terms. All contractual guarantees and terms and conditions must be retained together with the user manual. Changes to the system or its safeguards are not permitted. For all repair and maintenance works the company Wieland Dental + Technik GmbH & Co. KG must be informed and consulted. Changes to the system without the knowledge and approval of Wieland Dental + Technik GmbH & Co. KG will void the guarantee and liability claims.

Disposal

The disposal pursuant to the Electrical and Electronic Equipment Act is subject to the contractual terms.

1.5 Structure of the user manual

1.5.1 Principle

Our aim is to enable you to operate, maintain and repair the Zenotec system in a fast, efficient and qualified way as quickly as possible. This also involves that you know how to use the user manual. Further developments for our customers require constant revision and adjustment of the user manual. Consequently, the user manual cannot be transferred to other systems of this series. To ensure that the user manual is always complete and up to date, please do not remove individual documents. Current revisions of the user manual are available on the website of the company Wieland Dental + Technik GmbH & Co. KG under the following link:

<http://www.wielanddental.de/service/downloadcenter/>

1.5.2 Definitions

The following terms are used in the user manual:

Zenotec mini system, Zenotec mini milling machine or Zenotec mini machine refer to the Zenotec mini dental milling machine of the company WIELAND Dental + Technik GmbH & Co. KG. In addition, the following definitions apply:

- ▮ Blank refers to the material unit to be processed.
- ▮ Machine or system refers to the Zenotec mini dental milling system.
- ▮ Job or milling job refers to the job to be processed.
- ▮ Operator refers to the owner of the Zenotec mini system.

1.5.3 Symbols

Please remember the meaning of the following symbols:

		DANGER
	Indicates dangers which may result in fatal or serious injury if not observed!	
		WARNING
	Indicates dangers which may result in serious injury and/or invalidity if not observed!	
		CAUTION
	Indicates dangers which may result in injury and significant material, financial and environmental damage if not observed!	

1.5.4 Target group

All works with and on the Zenotec mini with and on the machine must be carried out by trained and instructed personnel only. A recognized technical qualification and thus the knowledge of conventional technical operations is required. The personnel must read and understand the user manual.

It is the responsibility of the operator of the system to select, instruct and control the personnel.

1.5.5 Layout conventions

The following layout conventions are used in this user manual:

- ▣ Bold print to highlight certain aspects or for section headings
- ▣ Letters in brackets after terms as reference for the position in the figure.

For example: "...select from "submenu" (D)..."

1.5.6 Additional system documentation

The additional documentation is filed in an additional folder:

- ▣ Terms of guarantee

2 Safety instructions and warnings

After manufacture, the Zenotec mini milling system is subjected to a quality test. Before delivery, the system is assembled and tested for its functionality. The functionality of the safety system is also tested. However, the dental milling system can still involve certain residual risks. Therefore, it is absolutely essential to observe the chapter "Safety instructions". The following general safety instructions are replaced by special safety instructions in the individual chapters.

2.1 Meaning of the general safety instructions

The general safety instructions in the present chapter provide information on potential residual risks, which, despite intended use of the Zenotec mini milling machine, cannot be avoided or may occur unexpectedly.

In order to avoid personal, material and environmental damage, the safety instructions must be observed by all persons working on the Zenotec mini milling machine. Consequently, these persons are obliged to read and understand the present chapter.

2.1.1 Meaning of the special safety instructions

Safety instructions applicable to certain situations are provided at the relevant position in the user manual. In order to prevent personal, material and environmental damage, the observance of these instructions is absolutely essential.

2.1.2 Statutory safety instructions

In addition to the safety instructions in the present user manual, the statutory accident prevention and environmental protection regulations applicable in the country of use of the Zenotec mini T1 milling machine and its place of installation. The generally recognized codes of practice for safe and expert working must also be observed.

2.1.3 Consequences in case of failure to observe the safety instructions

Failure to observe the safety instructions may result in accidents with serious personal, material or environmental damage.



The manufacturer will not be liable for damages resulting from the failure to observe the safety instructions.

Use

2.2.1 Principle

The Zenotec mini milling machine may only be used in technically perfect condition, in accordance with its designated use and the instructions set out in the present manual, and only by safetyconscious persons who are fully aware of the risks involved in operating the machine. However, personal, material and environmental hazards cannot be excluded during operation.

2.2.2 Technical condition

All malfunctions and defects, in particular if there is a risk that they may impair the safety of the Zenotec mini milling machine, must be rectified immediately. The company WIELAND Dental + Technik GmbH & Co. KG must be immediately notified of all malfunctions and defects. In addition, the use of the Zenotec mini milling machine must be discontinued until complete rectification.

2.2.3 Designated use

The Zenotec mini milling machine has been exclusively designed for milling dental prostheses. During milling operations, it must be observed that the machine cannot withstand all forces which may occur. The machines are suitable for processing of waxes, plastics (e.g. PMMA), and for zirconium oxides by the company WIELAND Dental + Technik GmbH & Co. KG. During processing, make sure that the immersion depth and feed rate are not too high. Otherwise, the workpiece might be pulled out and the tool may jam. This may cause irreparable damages to the machine and/or spindle.

The technical data in chapter “3.4 Technical data” apply as binding operation limits and characteristics. Designated use also includes the adherence to the instructions set out in the present user manual and the compliance with the inspection and maintenance works and the required personnel qualifications.

Any other use or use beyond this scope is considered unintended use. The manufacturer will not be liable for any resulting damages! The risk is borne solely by the operator!

2.2.4 Unintended use

- Incorrect use
- ▣ Unintended use
- ▣ Carrying out repairs without written approval of WIELAND Dental + Technik GmbH & Co. KG
- ▣ Use of accessories or spare parts by other manufacturers
- ▣ Unauthorized commissioning of the milling machine
- ▣ Uninstructed commissioning of the milling machine

Unintended use may result in the risk of: **Personal injury**
Machine damage **Damages to the processed product and other**
damages **Malfunctions of the Zenotec milling system**

2.3 General safety rules

2.3.1 Modification

Modifications to the milling system are principally not allowed. Additions and alterations to the system are always carried out by the company WIELAND Dental + Technik GmbH & Co. KG.

The adjustments in the user manual required in such case are implemented by the manufacturer.

2.3.2 Safety equipment

The safety equipment fitted to the Zenotec milling system must not be removed or deactivated for normal operation. In case of special operation, such as commissioning, maintenance and repair, the company WIELAND Dental + Technik GmbH & Co. KG must be informed. When carrying out the required disassembly of the safety equipment, all necessary precautions must be observed.

Normal operation must not be resumed until a complete check of the safety equipment for its functionality has been completed.

The safety equipment includes: **Cover of Zenotec mini** **Emergency off switch** **Cover of power and pneumatic connections**

2.3.3 Power supply

The power supply values indicated on the name plate and in the chapter "Product description" are binding for the power connection. It must be possible to switch off the power supply by means of the emergency off switch. The switching element is clearly marked.

2.3.4 Spare parts

Only the spare parts specified by the manufacturer may be used.

2.4 Responsibilities

2.4.1 Storage of system documentation

The user manual must always be stored in a place constantly accessible for all persons working on the Zenotec milling system. The storage location of the user manual must be clearly marked by the operator. Additional folders with the spare part documentation and the manufacturer documents must be accessible for the maintenance and service personnel of WIELAND Dental + Technik GmbH & Co. KG.

2.4.2 Manufacturer's obligations

The company WIELAND Dental + Technik GmbH & Co. KG is responsible for the product safety. In this context, essential obligations are transferred to the operator.

2.4.3 Operator's obligations

Training and responsibilities

The operator ensures that all activities on the Zenotec milling system are carried out by authorized persons only. He performs an indepth introduction according to the present user manual, even for persons only working occasionally on the milling system, especially with regard to the residual risks and the safety instructions. In this context, the operator defines clear responsibilities.

Instructions in case of danger

The operator ensures that his personnel is instructed on all existing residual risks and that all works carried out on the Zenotec milling system are in accordance with the present user manual. He ensures the provision and instruction of any equipment relevant to safety.

Maintenance obligation and duty of care

The operator ensures that the Zenotec system is maintained and operated in a technically perfect condition. For necessary repair works, the operator informs the company Firma WIELAND Dental + Technik GmbH & Co. KG.

2.4.4 Observation and notification

The operator is obliged to immediately notify the manufacturer of all (residual) risks and hazards observed during operation which are not described in the present user manual.

The instructions given and the measures prescribed by the manufacturer following a notification must be observed by the operator.

2.5 Personnel

2.5.1 Regulations and safety at work

The local safety and accident prevention regulations shall apply to the operation of the Zenotec system in any case. Before commissioning, the protective covers must be checked.

All working methods impairing the safety of the milling system are not allowed! All maintenance and service works must principally be carried out by personnel of the company WIELAND Dental + Technik GmbH & Co. KG only. The system must be switched off for such works.

Unauthorized alterations, maintenance works and changes are not allowed!

2.5.2 Operating personnel requirements

Every person dealing with the commissioning and operation of the milling system must have received adequate training and instructions for the relevant activity, read and understood the user manual and the chapters "Safety instructions" and "Operation of the system" in particular. Personnel under training must not work on the milling system unless under supervision of an experienced person.

2.5.3 Responsibilities

The company WIELAND Dental + Technik GmbH & Co. KG is responsible for the safety-related flawless condition of the delivered Zenotec system including user manual and supplied accessories and spare parts.

The operator is responsible for the designated use of the system, the training of the personnel, the provision of the required protective equipment, ensuring that only authorized persons work on the machine. The operating personnel is responsible to operate the system in perfect condition only, to notify the manufacturer immediately of any changes impairing the safety, to ensure a clean and clearly laid out environment of the system, to keep children away from the system, not to operate the system without supervision that, during works on the machine in maintenance mode and/or with the hood opened, the

operating personnel and all persons within reach of the machine wear protective goggles and, in case of long hair, a hairnet.

2.5.4 Work clothes

	
	Wearing of work clothes and protective equipment Crushing and drawing in of extremities and objects possible. Wear tightly fitting work clothes.

2.5.5 Personal protective equipment

 Caution	
	Wearing of hearing protection Loss of hearing and hearing impairments due to high sound pressure level possible. For direct works on running machine, hearing protection must be worn.

2.5.6 Working ergonomics

 Caution	
	Ergonomic working Eye damages, back damages and joint problems possible. Ensure optimum lighting, working height and seating position.

2.5.7 Clean workplace

A clean workplace must be ensured. The milling system and the working environment must be kept clean.

 Caution	
	Clean workplace and environment Injuries due to slipping, tripping and falling possible. Ensure a clean workplace. Exercise caution and care when working.

2.5.8 Behaviour in case of faults

All works for fault removal on the system must principally be carried out with the system switched off only. all faults must be notified to the company WIELAND Dental + Technik GmbH & Co. KG.

 WARNING	
	Fault removal in running operation Personal and material damage possible. Before starting these works, operate the EMERGENCY OFF button.

2.5.9 Special risks

The Zenotec milling system may present special risks in case of improper or unintended use by untrained personnel.

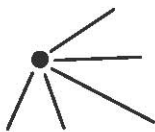
2.5.10 Electrical risks

Works on the electric supply must be carried out by employees of the company WIELAND Dental + Technik GmbH & Co. KG only.

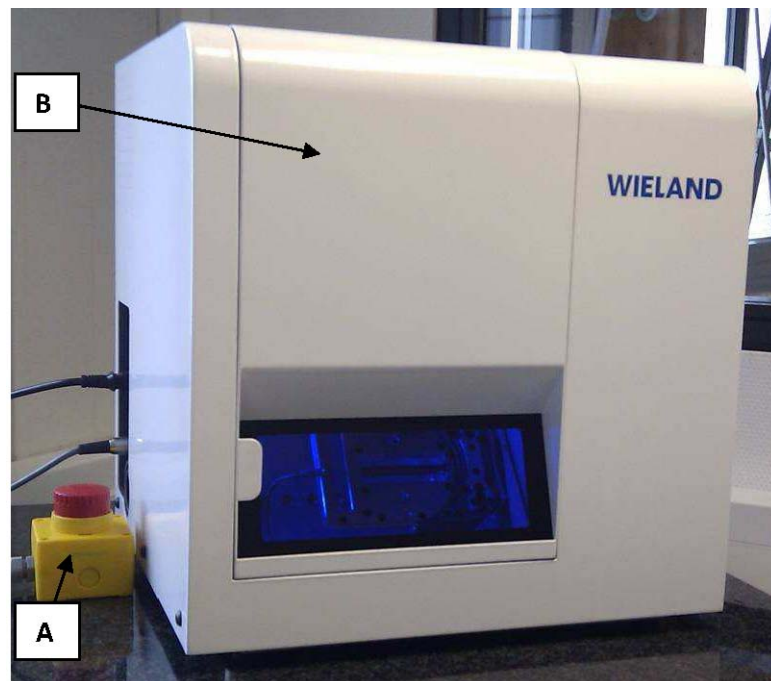
 WARNING	
	Open electric connections Fatal or serious injury possible in case of • loose connections, • damages, • mechanical and thermal loads. Witch the system off and notify the manufacturer.

2.5.11 Pneumatic risks

Works on the pneumatic supply must be carried out by employees of the company WIELAND Dental + Technik GmbH & Co. KG only.

 WARNING	
	Open pneumatic connections Severe personal damage possible. In case of loose pneumatic connections, switch off the system and notify the manufacturer.

2.5.12 Safety systems



Position	Safety equipment	Description
A	Emergency Off	If pressed, the system will stop immediately.
B	Cover	Covers the machining zone of the milling system.

2.5. Product-specific hazard warnings

Uncontrolled restart of the machine



Uncontrolled restart after power disconnection. After power disconnection of the machine, restart the machine.

3 Product description

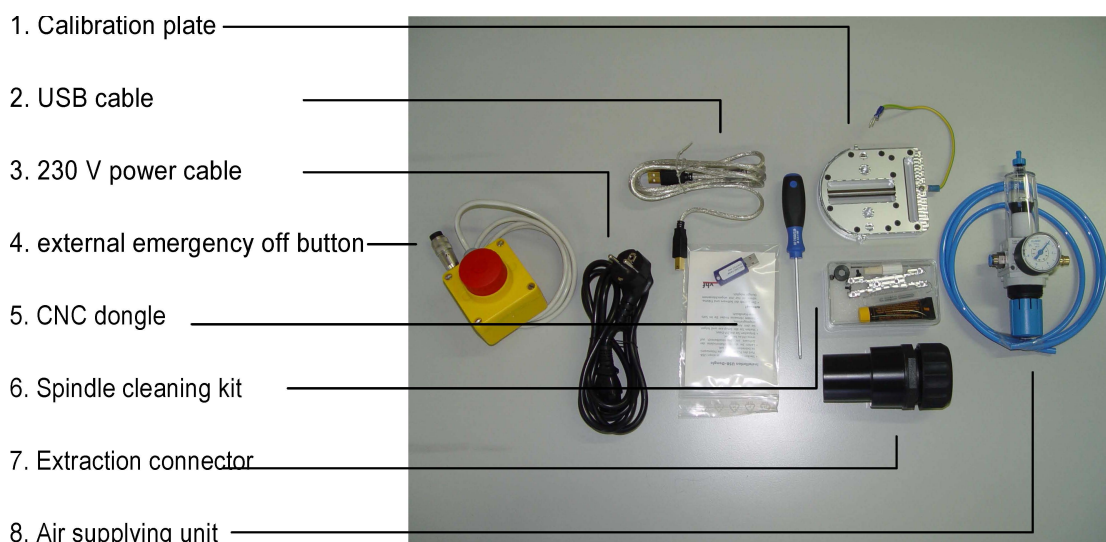
3.1 Versions

The following ZENOTEC mini versions are possible:

Version	Description
75-22-4000	ZENOTEC mini

3.2 Scope of delivery and optional items

The machine is delivered in fully assembled condition. The standard delivery scope of the Zenotec mini comprises the following items:



Quantity	Description	Item number
1	ZENOTEC CAM Basic	75229866
1	External emergency off button including connection cable	75224101
1	USB cable	75224102
1	Primary power cable (230 V power cable)	75224103
1	Calibration plate with measurement pin	75224104

The delivery scope may vary according to customer request.

3.3 Technical description

3.3.1 Concept

The milling system consists of the four-axis mechanism, high-frequency spindle SF 170P, integrated control electronics, accessories and control software.

The built-in high-frequency spindle allows high feeding rates. The precision bearing of the spindle axis ensures premium surface qualities for the workpieces to be processed. The rotational axis is equipped with a Harmonic Drive providing maximum concentricity for processing the workpieces over their entire circumference of 360 degrees.

The automatic measurement of the rotational axis and the automatic axis compensation ensure constant precision during processing.

3.3.2 Spindle

The built-in spindle is a high-frequency spindle SF 170P by the company Alfred Jäger GmbH. The milling method is dry milling. All chips and milling residues are largely removed by the integrated extraction system. The spindle ball bearings are equipped with a lifetime grease lubrication and are thus maintenance-free.

Technical spindle data

- Power rating in case of continuous load (S1): 170 W
- Speed range: 5,000 – 60,000 rpm □ pneumatic collet: 3 mm
- precision shaft on double bearing □ automatic toolchanging unit for 6 tools with automatic length measurement

The special strengths of this high-frequency spindle include the precise bearing of the shaft and the high speeds (up to 60,000 rpm). This allows to perform finest milling operations with maximum precision at high feed rates.

Attention!

The SF 170P high-frequency spindle is a precision instrument which must not be subject to use of force, such as hitting, excessive pressure on the shaft, forceful loading in the spindle support (clamping block) or eccentric pushing due to excessive tolerance at the spindle support!

Please observe that the spindle must be operated with the seal air switched on only.

Automatic toolchanging

Tool changing is made automatically with the SF 170P by means of a tool magazine with 6 tools. Obviously, all tools used must match the relevant position stored in the manufacturing software. Only tools with a shaft diameter of 3 mm must be used.

3.3.3 Extraction

The Zenotec milling system is prepared for extraction using an external extraction system. For this purpose, extraction holes are provided at the rear panel of the working space. When milling abrasive material, such as zirconium oxide, please ensure that the extraction system is activated, as particularly high amounts of fine dust occur during such works. If using the switch unit PSW 01, the extraction system is automatically switched on and off, but can also be switched off and on manually via the software.

Properties of the dust extraction

- Hose connector at the side of the housing
- 24 V switch output for PSW 01 switch unit (optional)

3.4 Technical data

3.4.1 Dimensions and weight

Description	Dimension
Dimensions while closed (WxHxD)	400 x 415 x 383 mm
Weight	approx. 45 kg

3.4.2 Mechanic elements

The Zenotec milling system has a compact lowweight table housing with high stiffness and maximum load capacity.

In addition, the following technical details should be mentioned:

- 4 axes; travel range (x/y/z): 100 x 100 x 40 mm
- 4th axis: Tolerancefree rotational axis with Harmonic Drive and maximum concentricity for processing the workpieces over their entire circumference of 360 degrees
- precision ball bearing spindles in the 3 linear axes with 4 mm pitch
- engine resolution < 1 µm
- repeat accuracy ± 0.005 mm
- highfrequency spindle with up to 60,000 rpm speed range
- fully enclosed working space with lockable front cover with safety contact
- work space illumination
- automatic measurement of rotational axis and automatic axis compensation for precise milling results
- lownoise

3.4.3 Control electronics

– quiet running and high precision due to microstep operation – rapid processing due to exponential acceleration ramps and automatic switchover in fullstep operation – simultaneous control of 4 axes – supplied with control software for comfortable output of data sets generated by the post

processor – speed limits – minimum

feed rate: 0.3 mm/s – maximum feed

rate: 55 mm/s

3.4.4 Power supply

The power supply values indicated on the name plate are binding for the power connection of the system. It must be possible to switch off the power supply on site. The power supply is clearly marked.

The following power supply values apply to the Zenotec mini milling system:

The air supply must be dry and free of oil.

Electricity:	
maximum power input	240 W
voltage	230 V 2A; (110 V 4A)
fuse	10 A
mains frequency	50 Hz
Compressed air:	
pressure	7 bar
volume	max. 80 l/min

3.4.5 Ambient conditions

The following ambient conditions apply to the Zenotec milling system:

Temperature	5 °C ... 45 °C
Humidity	max. 90 %

4 Initial commissioning

4.1 Space requirement

The installation and initial configuration of the ZENOTEC mini milling machine must be made by authorized technical personnel.

		CAUTION
	Sharp tool and workpiece	
	Operation only with safety equipment fully fitted and in good order.	
		CAUTION
	Danger due to milling dust	
	Injury of the lung and shortness of breath possible.	
	Check extraction system on a regular basis, clean, replace filters. Observe manufacturer's safety data sheets.	
	Do not operate system without extraction.	

4.2 Installation and connection of the system

The installation and connection of the system is made by authorized technical personnel of WIELAND Dental + Technik.



The assembly process must be carried out by authorized personnel of WIELAND Dental + Technik GmbH & Co. KG only. During assembly, it must be observed that:

- the assembly and initial commissioning is carried out by authorized technical personnel only;
- the assembly is carried out strictly in accordance with the assembly instructions and check lists by the manufacturer;
- a functional check of the system is carried out after assembly; and
- the system is released by a final check.

 CAUTION	
	Stability of the machine Serious injury and bruises in case of falling of the milling system. Observe the required stability of the milling system and the maximum load capacity of the installation site.

 CAUTION	
	Transport of the system Serious injury and bruises due to unsecured transport possible. Transport of the system must be carried out by authorized technical personnel only.

4.3 Installation

4.3.1 Requirements

Leave sufficient space on the righthand side of the machine for cable and hose connections (at least 20 cm). In order to be able to open the hinged protective cover, the dimensions in open condition must be observed.

 CAUTION	
Danger due to external impacts Personal and material damage possible Observe the assembly instructions during installation of the machine. The ambient conditions must correspond with the specifications of the milling system.	

The installation site should principally not be near electric interferences and possibly be vibrationfree.

The machine must be placed horizontally on a stable, flat surface with sufficient load capacity. The installation and orientation is carried out by trained technical personnel. Behind the machine, there must be sufficient space for ventilation (> 150 mm). A space of approx. 150 mm must be reserved on the lefthand side for cable and hose connections. In

order to be able to fully open the hinged cover, space requirement according to the figure above must be provided.

Sufficient space for configuration and operation is to be provided in front of the machine. Load capacity: observer machine weight (if applicable: including accessories) and equipment.

4.3.2 Connections

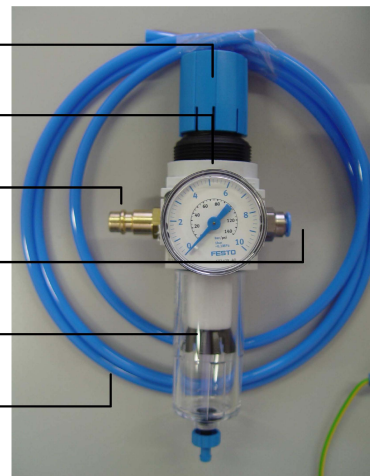
1. Connection switch unit extraction (option)
2. Power switch
3. Power connection
4. Connection external emergency off button
5. USB connection to control PC
6. Air supply connection
7. Connection dust extraction



4.3.3 Air supply unit

The supplied air supply unit regulates the compressed air supply to your machine. The recommended inlet pressure values (see technical data) and the air cleanliness must be observed.

1. Control valve compressed air inlet
2. Pressure gauge
3. Air supply nipple
4. Air supply outlet machine
5. Collection container
6. Connection hose machine



4.4 Emergency off switch

The emergency off switch is used to stop the machine in the quickest possible way: All drives are switched off without delay.

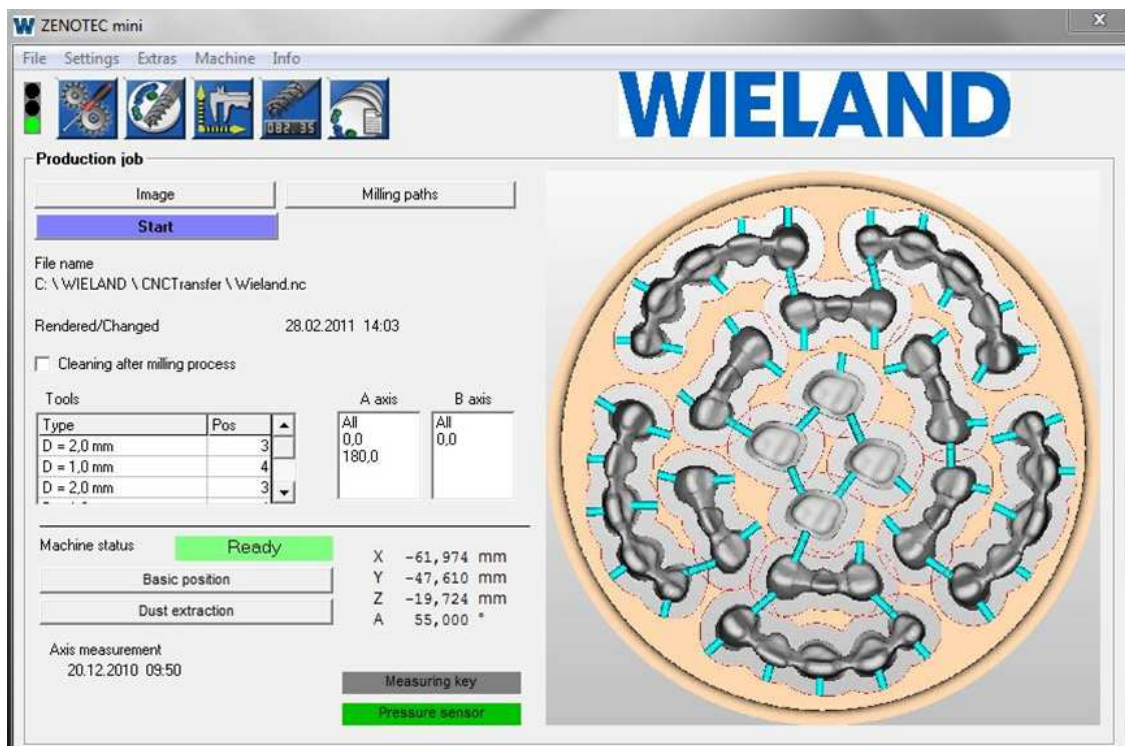
To unlock the emergency off switch, return the switch to the initial position by turning it to the right.

The emergency off switch must be freely accessible at all times. In this connection, please also observe the safety instructions!

4.5 Installation of CNC software

For installation of the CNC software, the current operating software of the machine must be downloaded first. You can find this on the website of the company WIELAND Dental + Technik GmbH & Co. KG under the link:
<http://www.wielanddental.de/service/downloadcenter/>

This ensures that you always have the current software status of the operating software. You can also use the file for uploading your existing Zenotec mini CNC software. After completion of the download: □ connect the dongle to the PC □ start the “Setup.exe” file □ follow the setup instructions



If you require an stl viewer, the freeofcharge software “Easy Fit” is included in the software package.

5 Operation and control

5.1 Requirements

Comprehensive training by employees of WIELAND Dental + Technik GmbH & Co. KG is a prerequisite for professional operation of the milling system.

5.2 Operating personnel requirements

Every person involved in commissioning and operation of the milling system must ☐ have received adequate training and instructions for the activity, ☐ have read and understood the user manual and the chapters "Safety instructions" and "Operation of the system", in particular.

Personnel under training must not work on the milling system unless under supervision of an experienced person.



All safety instructions in the user manual must be read and understood. Maintenance works on the milling system must be carried out by authorized technical personnel only.

5.3 Operation on the machine

5.3.1 Safety instructions for commissioning

The milling system has been designed in a way that the risks are reduced to a minimum. Therefore, the system has a number of safety devices. However, not all risks can be eliminated. Such residual risks are explained by the following warnings.

In principle, all warnings must be read and understood before working on the system.

Danger due to moving, pointed and sharp machine parts

Due to the safety equipment, the machine provides sufficient protection against cutting and crushing injuries. In particular, these injuries can be caused by the rotating spindle, the pneumatically moved parts and milling movements. Therefore, the system must be operated only with the protective equipment fitted and in good order.

 Warning	
	Danger due to moving, pointed and sharp machine parts Serious crushing and cutting injuries are possible if the cover is not closed. Only operate the system with the protective equipment fitted and in good order.

5.3.2 Starting the machine

To start the machine, operate the On/Off switch on the right side of the machine. Start the Zenotec mini CNC on the control computer.

The milling system performs a reference run and indicates the readiness for operation on the user interface.

5.3.3 Blank management

Please observe the user manual of the Zenotec CAM software.

5.3.4 Tools

The following milling cutters are recommended for use in the Zenotec mini:

- ▣ Item no. 6920020001: HS milling cutter, 2.5 mm, with spring collar for zirconium oxide, PMMA & wax
- ▣ Item no. 6920020002: HS milling cutter, 1.0 mm, with spring collar for zirconium oxide, PMMA & wax
- ▣ Item no. 6920020003: HS milling cutter, 0.7 mm, with spring collar for zirconium oxide, PMMA & wax

The front cover offers protection against injuries resulting from the rotating spindle and tools. Risks due to sharp edges, moving parts and pointed objects can occur on the spindle and tools. The milling system must be operated with the cover closed only.

 Warning	
	Danger due to rotating spindle, sharp tools and moving axes Cutting and stab injuries possible. Only operate the machine with the cover closed.

Arrangement and numbering of tools

The 6 milling cutter slots are to be allocated as follows: The 6 milling cutter slots are to be allocated as follows:

2.5 mm milling cutter for zirconium oxide	1. 2.5 mm milling cutter for zirconium oxide	_____
1.0 mm milling cutter for zirconium oxide	2. 1.0 mm milling cutter for zirconium oxide	
0.7 mm milling cutter for zirconium oxide	3. 0.7 mm milling cutter for zirconium oxide	
2.5 mm milling cutter for PMMA and wax	4. 2.5 mm milling cutter for PMMA and wax	
1.0 mm milling cutter for PMMA and wax	5. 1.0 mm milling cutter for PMMA and wax	_____
6. 0.7 mm milling cutter for PMMA and wax or: measurement pin for calibration procedure	6. 0.7 mm milling cutter for PMMA and wax or: measurement pin for calibration procedure	

The tool arrangement can also be seen in the machine control.

Switching off the milling system



Before switching off the system it must be ensured that: ☐ the machine is not processing a milling job; ☐ all dust and milling residues are removed; ☐ the blank holder and tools are in their initial position.

Faults

If faults occur during operation, do the following: ▫ notify the company WIELAND Dental + Technik GmbH & Co. KG; ▫ disconnect the machines from the power supply; and ▫ ensure that the trouble shooting and fault removal is carried out by authorized technical personnel only.

		CAUTION
Fault removal and trouble shooting by authorized technical personnel only.		

		Danger
	Before opening the machine housing, disconnect the system from the power supply: Remove the mains plug.	

In case of any kind of fault, the manufacturer must be notified. All types of maintenance works must be performed by authorized and trained personnel only.

For troubleshooting and fault removal, the system must be disconnected from the power supply.

Danger zones are possible particularly due to rotating tools, movements during automatic tool change and axis movement of the spindle.

Contact details for service and questions

In case of questions concerning the Zenotec mini milling system, please contact:



Wieland Dental + Technik GmbH & Co. KG

Lindenstraße 2
75175 Pforzheim Germany

Zenotec Support

Phone national: 08 00 / 93 66 823

Phone international: +49 72 31 / 37 05 400 Fax: 0 72 31 / 35 79 59

email: info@wielanddental.de

www.wielanddental.de

6.1 Removal of faults

The following table mainly describes faults that may occur during startup of the system. If it is not possible to start the milling system by implementing the described measures, a member of the WIELAND Dental + Technik GmbH & Co. KG service team should be consulted.

7 Cleaning

7.1 General

Regular cleaning and maintenance helps to maintain the operational safety of the machine and to increase the service life.

Please always observe the safety instructions.

7.2 Use of cleaning agents

Cleaning agents attacking plastics, rubber or paints must not be used. They may cause damage to hoses (pneumatic system), cables and seals.

In principle, cleaning agents may contain hazardous substances. Please observe the information given by the manufacturers.

7.3 General cleanliness

As with any other highquality technical equipment, cleanliness is very important as this increases the service life of the individual components and avoids malfunctions. Therefore, you should clean the machine regularly using a vacuum cleaner. While doing so, ensure that no dirt does enter the mechanic elements of the machine. The glass panes and plastic surfaces can be cleaned by means of a nonabrasive liquid cleaner.

		CAUTION
	Keep the working space and environment clean.	
	Regularly check the functionality of the gas shock absorbers;	
	Maintenance matrix: monthly	

Blank holder:

The blank holder must be cleared of all chips and dust every time before inserting a blank to ensure optimum clamping. We recommend use of a suitable brush. The bolts and threads must be kept clean in addition.

Tool holder:

To ensure an accurate change of tools, the tool holders must be kept clear of dust and chips. Faulty or worn tool holders must be replaced. In this case, please contact the service.

Spindle:

The Zenotec mini milling system uses a highfrequency spindle by the company Jäger. It has a speed range between 10,000 – 60,000 rpm. To ensure a long service life of the spindle, a number of things should be observed. The spindle must be operated with clean, dry and oilfree compressed air only

Air cleanliness:

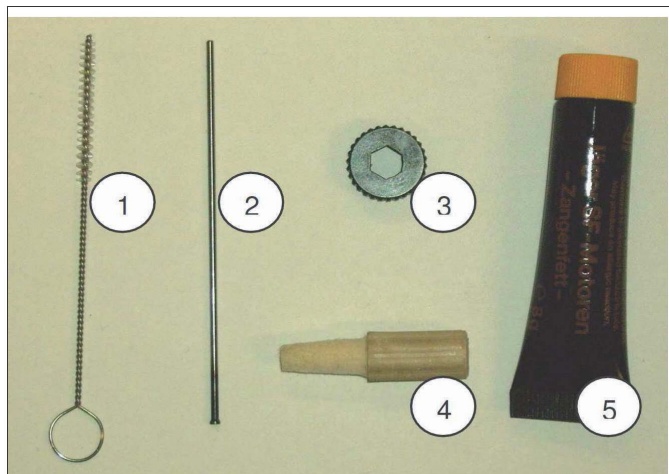
Solid contaminants	Class	3
Water content	Class	4
Total oil content	Class	3

Never apply spray oils, liquids or compressed air directly to the centrifugal disk of the spindle nose to prevent moisture or dirt from entering the bearings. The spindle nose and the tools used must be cleaned. Contaminations and the resulting increased centrifugal forces cause an excessive load to the bearings.

The cleaning instructions by the manufacturer must be observed.

Collet:

For cleaning and maintenance of the collet, use the supplied collet maintenance kit.



The collet maintenance kit comprises:

- (1) Cleaning brush
- (2) Ejector pin
- (3) Screw-in piece
- (4) Felt cone
- (5) Chuck grease

The collet must be cleaned daily by means of the supplied cleaning brush (1). The collet must be removed and cleaned at least once per week and after every manual tool change or tool breakage. It must be checked for potential damages.

Important: The collet must never be closed without a tool inserted! If the spindle rotates without a tool, it may be destructed!

Procedure for cleaning the collet:

Ensure that the shaft is not rotating. Open the collet by pressing the button "Collet open/close" and make sure that the tool located in the spindle does not fall down. Now, remove the tool from the collet. Use the screwin piece (3) to unscrew the collet from the shaft. Clean the collet holder in the shaft by means of the felt cone (4) provided for that purpose.

Clean the collet using the brush (1) provided for that purpose. Ensure that no dirt is inside the collet and that it is not contaminated during the procedure. If a tool breaks and the remainder remains in the collet, you can use the ejector pin (2) to remove it.

Apply a thin grease coat to the cone of the collet (collet grease (5)). Manually screw the collet back in the spindle.

The collet must be screwed in as far as it will go, but must be tightened by hand only. If the collet cannot

be turned as far as it will go by hand, please use the screwin piece. Replace the tool in the shaft. Now, operate the button.

8 Maintenance

8.1 Check list

Procedure for cleaning the collet:

- ☐ Clean machine space, tool holders, tool shafts of all tools, check compressed air according to specification.

Daily maintenance

- ☐ Clean the collet using the cleaning brush supplied (spindle maintenance kit).

Weekly maintenance (also to be carried out after tool breakage)

- ☐ Remove collet, clean, check for damages, slightly lubricate cone. ☐ Clean collet holder on the spindle using the felt cones supplied.

9 Repairs

 Warning	
	Danger when opening the machine housing Fatal or serious injury due to electric shock possible. Do not open the machine housing. Repairs must be carried out by authorized technical personnel only.

All repair works must be carried out by authorized technical personnel of WIELAND Dental + Technik GmbH & Co. KG only.

LEADING DIGITAL ESTHETICS



Wieland Dental sets the standards in dental technology and stands for innovation and quality. As a medium-sized enterprise with over 140 years' experience we are one of the world's leading suppliers in the field of dental technology. Future-ready integrated technologies and materials are the hallmarks of our expertise and prowess. Wieland Dental opens up the way to progress in dental technology. www.wieland-dental.de



Wieland Dental+Technik GmbH & Co. KG
Lindenstraße 2, 75175 Pforzheim, Germany
Fon +49 72 31/37 05 -0 • info@wieland-dental.de
www.wieland-dental.de